

5 steps of grey series black – white ($N_d - W_d$)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12								
Linear mixture between black and white in CIELAB colour space	relative CIELAB								
	lab^*w_d setgray	$lab^*000n_d=000n_d$ 000n_d setcmykcolor	$lab^*cmy0_d=cmy0_d$ cmy0_d setcmykcolor	$lab^*rgb_d=rgb_d$ rgb_d setrgbcolor					
1,00 N_d +0,00 W_d (Black N_d)	0,00	0,00 0,00 0,00 1,00	1,00 1,00 1,00 0,00	0,00 0,00 0,00					
0,75 N_d +0,25 W_d	0,25	0,00 0,00 0,00 0,75	0,75 0,75 0,75 0,00	0,25 0,25 0,25					
0,50 N_d +0,50 W_d	0,50	0,00 0,00 0,00 0,50	0,50 0,50 0,50 0,00	0,50 0,50 0,50					
0,25 N_d +0,75 W_d	0,75	0,00 0,00 0,00 0,25	0,25 0,25 0,25 0,00	0,75 0,75 0,75					
0,00 N_d +1,00 W_d (white W_d)	1,00	0,00 0,00 0,00 0,00	0,00 0,00 0,00 0,00	1,00 1,00 1,00					

SE250-1

5 steps of grey series black – white ($N_d - W_d$)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12								
Linear mixture between black and white in CIELAB colour space	Standard CIELAB $LAB^*LAB^*_d = LAB^*_d$ LAB^*_d setcolor			adapted CIELAB $LAB^*LAB^*_{a,d} = LAB^*_{a,d}$ $LAB^*_{a,d}$ setcolor			relative CIELAB $lab^*ncu^*_d = ncu^*_d$ ncu^*_d setcolor		
	1,00 N_d +0,00 W_d (Black N_d)	18,01	0,50	-0,40	18,01	0,00	0,00	1,00	0,00
0,75 N_d +0,25 W_d	37,35	0,10	0,80	37,35	0,00	0,00	0,75	0,00	R00Y $_d$
0,50 N_d +0,50 W_d	56,70	-0,10	2,10	56,70	0,00	0,00	0,50	0,00	R00Y $_d$
0,25 N_d +0,75 W_d	76,05	-0,50	-3,40	76,05	0,00	0,00	0,25	0,00	R00Y $_d$
0,00 N_d +1,00 W_d (white W_d)	95,41	-0,98	4,76	95,41	0,00	0,00	0,00	0,00	R00Y $_d$

SE250-3

5 steps of colour series cyan blue – white (C _d – W _d)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12						
Linear mixture between cyan blue and white in CIELAB colour space	Standard CIELAB <i>LAB*LAB_d = LAB_d</i> <i>LAB_d setcolor</i>			relative CIELAB <i>lab*cmy0_d = cmy0_d</i> <i>cmy0_d setcmykcolor</i>		relative CIELAB <i>lab*rgb_d = rgb_d</i> <i>rgb_d setrgbcolor</i>	
	1,00C _d +0,00W _d (cyan blue C _d)	58,62	-30,62	-42,74	1,00	0,00	0,00
0,75C _d +0,25W _d	67,82	-23,21	-30,86	0,75	0,00	0,00	0,00
0,50C _d +0,50W _d	77,02	-15,80	-18,98	0,50	0,00	0,00	0,00
0,25C _d +0,75W _d	86,21	-8,39	-7,11	0,25	0,00	0,00	0,00
0,00C _d +1,00W _d (white W _d)	95,41	-0,98	4,76	0,00	0,00	0,00	0,00

SE250-5

5 steps of colour series cyan blue – white (C _d – W _d)	Colour space, colour space coordinates and PostScript operator calculations according to ISO/IEC 15775:1999-12								
Linear mixture between cyan blue and white in CIELAB colour space	adapted CIELAB LAB*LAB ^{a,d} =LAB ^{a,d} LAB ^{a,d} setcolor			relative CIELAB lab*tch ^a _d = tch ^a _d tch ^a _d setcolor			relative CIELAB lab*ncu ^a _d = ncu ^a _d ncu ^a _d setcolor		
	1,00C _d +0,00W _d (cyan blue C _d)	58,62	-30,34	-45,01	0,500	1,000	0,656	0,000	1,000
0,75C _d +0,25W _d	67,82	-22,75	-33,75	0,625	0,750	0,656	0,000	0,750	G42C _d
0,50C _d +0,50W _d	77,02	-15,17	-22,50	0,750	0,500	0,656	0,000	0,500	G42C _d
0,25C _d +0,75W _d	86,21	-7,58	-11,25	0,875	0,250	0,656	0,000	0,250	G42C _d
0,00C _d +1,00W _d (white W _d)	95,41	0,00	0,00	1,000	0,000	0,000	0,000	0,000	R00Y _d

SE250-7

TUB-test chart SE25; colour space and coordinates
5 step colour scales and user friendly coordinates

Application of colour in daily life or in Colour Information Technology (IT)

Design, architecture, art, industrial products Measured for CIE standard illuminant D65	Colour Information Technology Measured for CIE illuminants D65 and D50
colour order system; name and coordinates: <i>RAL Design System (CIELAB)</i> $L^*C^*_{ab}h_{ab}$, lightness, chroma, hue angle <i>Munsell Colour System</i> VCH, lightness (Value), Chroma, Hue text <i>Natural Colour System (NCS)</i> ncu^*_e : relative blackness, relative chroma relative elementary hue text	Device system name and coordinates: Printer system (illuminants D50 or D65): cmy_d , content of "cyan, magenta, yellow" Display system (standard illuminant D65): rgb_d/RGB_d , content of "red, green, blue" <i>No user friendly colour coordinates</i> <i>Nearly no connection to colour order systems</i>

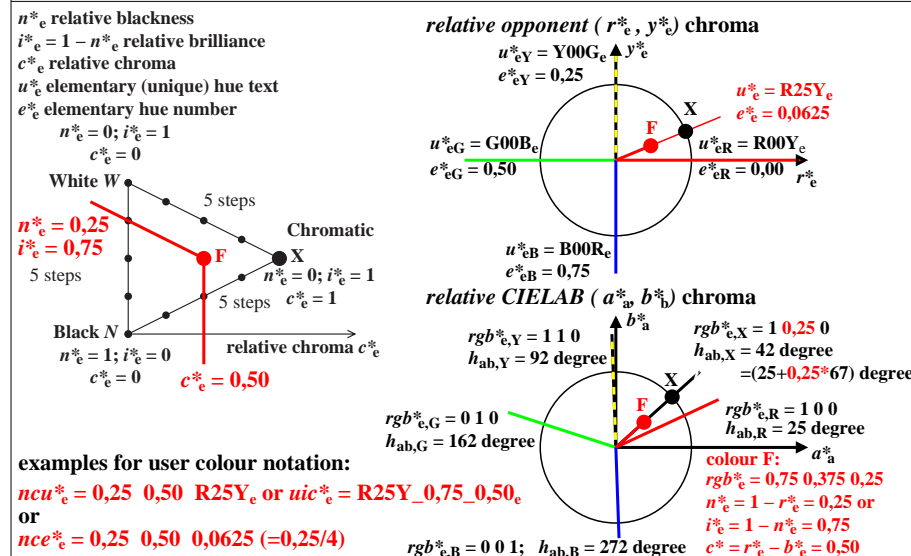
Aim: define user friendly connection

New: Interpretation of the rgb colour data in the range 0 to 1 as elementary colour data rgb^*_e

Linear relations between *relative* and *absolute* coordinates $lab^*_d - LAB^*_d$ and $lab^*_e - LAB^*_e$
 $rgb^*_d - (L^*a^*b^*C^*_{ab}h_{ab})_d$ and $rgb^*_e - (L^*a^*b^*C^*_{ab}h_{ab})_e$ (CIELAB)
 $rgb_d - cmy_d$, $rgb^*_d - cmy^*_d$ and $rgb_e - cmy_e$, $rgb^*_e - cmy^*_e$ ("1-minus"-relation)
 $rgb^*_d - ncu^*_d$, $rgb^*_e - ncu^*_e$ and $rgb^*_e - ncu^*_e$, $rgb^*_e - ncu^*_e$
relative coordinates lab^*_e : elementary redness r^*_e , greenness g^*_e , blueness b^*_e , blackness n^*_e
chroma c^*_d , elementary hue e^*_e , elementary hue text u^*_e

SE251-3

User friendly colorimetric CIE colour notation ncu^*_e or uic^*_e or nce^*_e and linear relation to rgb^*_e data



SE251-7

input: w/rgb/cmyk \rightarrow w/rgb/cmyk_d
output: no change